AUSTRALIAN INDUSTRY STANDARDS

INDUSTRY OUTLOOK

2021

WATER

INDUSTRY REFERENCE COMMITTEE

ABOUT THIS INDUSTRY OUTLOOK

The Industry Reference Committee (IRC) Industry Outlooks focus on the prioritisation of the skill needs of the industry sectors each IRC has responsibility for. The Water IRC Industry Outlook identifies the priority skill needs of the Water industry following a stakeholder consultation and research process conducted by Australian Industry Standards (AIS) on behalf of the IRC.

The document is deliberately brief, it does not seek to identify every issue within every sector. It is a snapshot of a continually evolving story that is intended to alert and inform a wide audience and enhance the industry's capacity to act.

IRCs are required to consult broadly with stakeholders to ensure a whole-of-industry view about the opportunities and challenges for the workforce and the Training Package review work necessary to meet industry needs.

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FROM THE CHAIR

The Water industry offers vital services fundamental to national prosperity and economic growth, providing water and sewerage systems to households and businesses, and irrigation water for agriculture. Water and sewerage services generated an estimated annual revenue of $22.68 billion in 2020-21. The industry employs nearly 27,700 people across its sub-sectors in water catchment supply, sewerage, drainage services and water pipeline transport (Network).

Implementation of technological advancements in the Water industry are improving operations and processes. The industry is utilising data analytics, simulation and modelling to collect real time data to optimise processes. This technology can forecast the behaviour of the network, predict faults before they occur, and reduce energy costs. Visual and acoustic equipment are being used in pipe inspections to detect leakages or locate blockages.

The water industry also plays an important role in tackling COVID-19. Wastewater testing can detect traces of COVID-19 long before the symptoms are displayed among communities. The industry has programs in place to track and monitor the presence of the virus in wastewater.

COVID-19 has also expedited the utilisation and implementation of digital platforms which are reshaping customer behaviour. The water industry needs to be agile in managing the relationship with customers to increase their value proposition. There is also a growing social expectation that organisations should provide increased customer service and improved transparency of their services.

The Water IRC has noted a shortage of training providers and individual trainers with the necessary proficiencies to meet ASQA requirements to deliver training. The IRC has emphasised the industry's need for coordinated workforce strategies to 'grow their own' trainers to maintain supply and mitigate the impacts of retirement of specialised trainers. The issue is more challenging in regional areas where training delivery is associated with high costs.

The Water IRC is proposing projects to reflect recent changes and use of technology in asset maintenance and flood site operations. These projects will address the use of photographic or live visual feed equipment in asset maintenance as well as effective management of flood runoff to ensure water reserves are not contaminated.

The IRC will continue monitoring the industry landscape and review and update qualifications to ensure a resilient and agile workforce that can adapt to new technologies, changing work practices and regulations.

George Wall
Water IRC Chair
This IRC Industry Outlook was agreed to by the Water IRC on 7 June 2021.

WATER INDUSTRY REFERENCE COMMITTEE

The Water Industry Reference Committee provides the formal conduit for the Water industry in gathering information from the sector – including challenges, opportunities, trends, and skills requirements for training via the Vocational Education and Training (VET) system.

The Water Industry Reference Committee comprises industry leaders and experts who work to ensure skills standards and qualifications are developed to meet the needs of industry, now and into the future. This work involves engaging with broader industry stakeholders to ensure that skills standards keep pace with changing industry needs, technology innovations and regulatory requirements. The IRC also ensures that qualifications are responsive and support the portability of skills.

WATER TRAINING PACKAGE

The IRC oversees nationally endorsed qualifications, referred to as the *Water Training Package*. The NWP Water Industry Training Package provides the only nationally recognised Vocational Education and Training (VET) qualifications for occupations involved in water industry operations (generalist, treatment, networks, source, irrigation, hydrography, trade waste), treatment (drinking water, wastewater) and irrigation.

The NWP National Water Training Package comprises four qualifications, 9 Skill Sets and 165 Units of Competency and associated Assessment Requirements covering these sectors.

WATER IRC MEMBERS

Chair **George Wall**
Water Industry Operators Association of Australia

Deputy Chair **Robert Allen**
Icon Water

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WATER INDUSTRY OVERVIEW

The Water industry employs 27,700 people across its sub-sectors: water supply, sewerage, drainage services and pipeline transport (water).

165
Units of Competency

4
Qualifications

9
Skill Sets

27
Registered Training Organisations

Gender Distribution

30%

70%

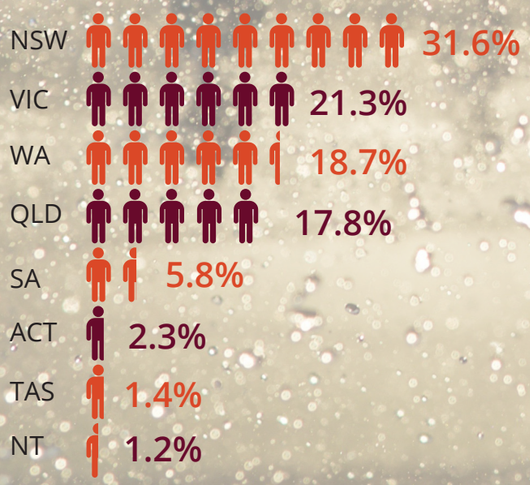
Ageing Rate
1.5X
faster than all industries

44.6
Average Age

Current and Projected Workforce Size

7.9%
Employment Growth to 2026

Workforce Size by State



Industry Value

Revenue
$22.68B
2019-20

Value Add
$11.38B

Business Composition

784
Small Businesses

48
Medium Businesses

18
Large Businesses

850
Total Number of Enterprises

INDUSTRY FAST FACTS

15.3%
of water used by households

820
major dams in Australia

99%
of Aus apprentices are full-time

60%
of water used in agriculture

14%
of Aus apprentices are 19 years and younger

67%
of Aus apprentices are 25 years and older

94%
of Aus apprentices are male

9%
of Aus apprentices identify as indigenous

IRC RESPONSE TO SKILLS NEEDS

Water Industry Trends

Wastewater and COVID-19

Wastewater testing can detect COVID-19 long before the community displays the symptoms. The industry is active in this regard. There are programs in place which track and monitor the presence of virus fragments in wastewater.

Workforce Impact

The workforce needs to be abreast of the latest developments in the industry due to the pandemic to meet compliance, health and safety requirements.

The IRC Response

- The IRC will monitor this issue through targeted stakeholder consultation/ engagement validating the industry's ability to counter the COVID-19 threat.

Water Industry Trends

COVID-19 and Digital Technologies

The pandemic has created a surge in the uptake of digital and remote connection technologies. Data analytics enables digital simulation and modelling of water networks to collect real-time data from control systems and sensors, optimise operations, forecast the behaviour of water networks, and predict issues. Big Data analytics can also predict supply and demand availability to ensure water security and identify the need for infrastructure upgrades. The IoT in the water sector is focused on Intelligent Water Metering (e.g. automatic meter reading, meter data management, sensor device management, networks and transmission, energy management); Intelligent Asset Management and Operations (e.g. Supervisory Control and Data Acquisition (SCADA), remote condition monitoring, condition based maintenance, automated water quality and control) and Data Acquisition and Insights. VR technology is being used as a training tool to assist with safety and site inductions and to enable training in the current pandemic environment.

Workforce Impact

The workforce will require skills for new digital and remote technologies and data analysis/ management.

The IRC Response

- The IRC will refer to various Digital Transformation reports to inform its thinking.
- The IRC has addressed some of these issues through the recently endorsed National Water Training Package (release 4.0). New Units of Competency and updated core units and electives will incorporate contemporary industry practices and new technologies.
- IRC identifies a gap with knowledge and skills relating to SCADA usage for the water industry. This is currently being investigated by the IRC.

Water Industry Trends

Automation, Robotics, and Innovations in Asset Management

The pandemic has accelerated the adoption of automation and robotics to reduce human-dependent tasks and enhance business resilience. Water asset management has been significantly transformed in recent years. In the past, blocked pipes had to be excavated and inspected closely by a professional plumber to locate and repair problems. Optical sonar technology equipped with microphones can accurately detect the smallest water leaks. Visual inspections via CCTV are being used to accurately detect and prevent asset issues. A sewer or drain camera system makes it possible to locate and identify blockages or damage to storm water drains, plumbing pipes and sewer systems. Robotics technology, including solar-powered robots, are used to collect water samples and other water quality information, improving operational efficiency. Robotics technology has also been used to assess wastewater asset conditions, collecting data on remaining service life and asset value. Non-destructive inspection and repair of assets is providing substantial savings for the industry.

Workforce Impact

The industry has the opportunity to automate low-skill tasks. Retraining and up-skilling will be needed to ensure the workforce is well-informed of emerging technologies, to maintain assets, and improve water utility efficiency.

The workforce will require new skills in the use of visual technology and equipment deployed to monitor, inspect, maintain, and repair water network assets.

The IRC Response

- The Water IRC is proposing to develop a new Unit of Competency for operators of non-destructive photographic or live visual feed equipment for the purpose of monitoring, repairing, or replacing damaged or aging water network assets.
- The IRC will continue to refer to the Digital Transformation Expert Panel's Strategy to inform its thinking.

Water Industry Trends

Industry-Specific Cybersecurity

Digitalisation transformation can expose the industry to cyber threats. The water industry is transforming its information and operational technology environments, relying increasingly on digital technologies, automation, AI, robotics, and smart IoT devices. As systems become more interconnected and digitalised, the risks of cyber threats increase considerably. Cyber resilience is becoming more important in the industry. Industrial Control Systems (ICS) such as Supervisory Control and Data Acquisition (SCADA) are becoming more vulnerable to cyber threats. New digital systems also engage in data sharing and organisations need to handle information securely, highlighting the significance of a cyber security preparedness.

Workforce Impact

Workforce skills need to be developed to:

a. minimise the risk of cyber attacks, and

b. reinstate digital businesses systems as quickly as possible in the event of a cybersecurity incident – including compliance with regulatory requirements.

The IRC Response

- The IRC is monitoring the Skill Sets recently developed by other IRCs and the work of the Digital Skills Organisation (SO) pilot. The Water Industry Operations TAC determined that workers are more likely to complete a Cybersecurity qualification rather than a relevant unit within a Water qualification.

Water Industry Trends

Customer Service in a Digital Age

Digital technologies and online platforms are rapidly reshaping customer behaviour. Smart technologies have enabled the industry to predict issues before they affect customers. The water industry needs to be agile in managing the relationship with customers. There is also a growing social expectation that organisations should provide increased customer service. Digitalisation also allows proactive communication with customers in detecting and rectifying their issues before they call to report a disruption.

Workforce Impact

The industry requires a flexible workforce with skills such as creativity, problem-solving, critical thinking and specialists who may create human-centred techniques such as design thinking. Digital skills are equally important as customer engagement is mediated via digital platforms.

The IRC Response

- The IRC will conduct regular targeted stakeholder consultation / engagement to identify and respond to priority customer service skill needs.
- The IRC will monitor the content of imported customer service units from other Training Packages to ensure they meet the need of the water industry.

Water Industry Trends

Ageing Workforce

The industry has a large proportion (36 per cent) of older workers aged 50 or over, many of whom are projected to retire in the next 10-15 years. The pace of technological change, and the capacity for the existing older workforce to adapt to the new technologies are a challenge for the industry. Water utilities need to continue to look at how they promote careers in the industry, particularly entry level roles. Workforce planning and development strategies such as mentoring programs are essential to creating and retaining a viable and productive workforce.

Workforce Impact

Workforce planning needs to balance employing younger workers with technological skills, while ensuring accumulated corporate knowledge of the more experienced water industry workforce is maintained.

The IRC Response

- The IRC will provide pathway information in the CVIG to assist and identify job roles/ careers in the Water Industry.

Water Industry Trends

Shortage of Trainers

The Water IRC is concerned about a shortage of training providers and individual trainers able to meet ASQA requirements to deliver training from the NWP. There are increasing requirements and costs for RTOs and specialised trainers to maintain accreditation. Trainers who retire are often not replaced. The IRC also believes there is a lack of coordinated strategies within the water industry to 'grow their own' trainers. The water industry is geographically dispersed with a water supply and/or wastewater treatment plant servicing all major cities and a considerable majority of smaller towns and villages. The delivery of training to operators in regional and remote areas is becoming increasingly expensive and difficult. Due to the specialist nature of the operational processes, development of suitable training resources for units in NWP is extremely expensive, particularly with a small cohort of potential trainees. The shortage of trainers impacts the workforce having access to accredited training, particularly in rural areas.

Workforce Impact

The lack of Industry trainers/RTOs will impact on the skill level of workers in all states and territories, particularly in rural and remote areas. It is difficult to get trainers with the right skills to meet ASQA requirements. As an essential service which protects public health and the environment, access to training for all operators is vital.

The IRC Response

- The IRC will monitor the situation and engage with stakeholders to assist industry where possible to address this issue.

Water Industry Trends

Open Channel Meter Certification

With a requirement to certify open channel meters annually, it has been identified that there is a shortage of certifiers in NSW which potentially will impact NSW Water supplies. It is a legislative requirement in NSW for Open Channel Meters to be validated annually by a Duly Qualified Person (DQP). A Certified Practising Hydrographer (CPH) is considered a DQP.

Workforce Impact

There is a need to provide these skills for Industry to be able to certify more industry workers in Open Channel Meter Certification. The lack of certifiers may ultimately impact the water supply reserves.

The IRC Response

- The IRC is further investigating the need to develop a new Unit of Competency and Skill Set so industry workers can become a DQP.

Water Industry Trends

Network Asset Maintenance

The aging Water infrastructure and maintenance operations impose high costs on the industry. New methods, such as non-destructive and remedial maintenance, lower repairing and maintenance costs. The industry is more increasingly using in situ drain and pipe cleaning by a variety of techniques including flushing, air scouring, swabbing and ice pigging. It is vital that pipelines carrying drinking water be cleansed to appropriate health standards after maintenance. The growing use of high-pressure water blasting to clean drains and network infrastructure requires the development of products to ensure safe operations.

Workforce Impact

New drain and pipe cleaning techniques are tasks which require network maintenance workers to have the specific skills and knowledge to conduct their tasks safely and eliminate the risk of injury or damage to themselves or the infrastructure.

The IRC Response

- The water industry IRC is proposing two new Units of Competency to address the skills required for the safe operation of network maintenance.

Water Industry Trends

Flood Site Operations

Recent floods in Australia have highlighted the significance of flood site operations. Flood waters are often contaminated by a variety of contaminants that get caught in its path. Flood runoff poses a serious threat of contaminating fresh drinking water and endangering community's health. Therefore, effective management of flood runoff is vital to ensuring water reserves are not contaminated. This requires identifying warning signs for a flood and taking action to manage excess water runoff.

Workforce Impact

Effective flood site operations require the workforce to have specific skills and knowledge to identify potential hazards related to large amounts of water by using and monitoring warning equipment.

The IRC Response

- The IRC is proposing to develop a new Unit of Competency and Skill Set in operating and maintaining a flood warning site. The IRC have met with water industry experts and determined the need for this skill as it will aid in better operation and maintenance of flood warning sites.

KEEPING INDUSTRY ENGAGED

Industry plays a key role in the identification of skills needs and the development of skills standards. An industry-led Vocational Education and Training (VET) system brings together industry and the VET sector with the joint goal of growing the capability and agility of Australia's workforce in line with industry's current and emerging skill needs.

With the advent of the double disruption of COVID-19 and accelerating digital transformation, there is an even greater need to ensure we have a workforce with the right skills at the right time. The Australian economic recovery and our global competitiveness will be underpinned by a strong and responsive vocational education and training system.

Fundamental to a strong and responsive vocational education and training system is engagement with industry stakeholders. A strong industry voice and its leadership of the VET system will be central to ensuring that we leave no worker behind in the journey ahead.

The VET system plays a significant role in ensuring enterprises have a highly skilled workforce, with opportunities to upskill and reskill existing workers, as well as prepare new entrants for the world of work. Industry leadership and engagement will ensure training to meet the needs of employers, provide better job outcomes, and equip workers with transferrable skills to increase their mobility and broaden their career paths.

The industry can support the Water IRC to collect evidence-based data through a range of intelligence gathering methods and engagement activities to ensure advice and decision making is informed, accurate, and reflective of industry needs.

ABOUT AUSTRALIAN INDUSTRY STANDARDS

Australian Industry Standards (AIS) provides high-quality, professional secretariat services to the Water IRC in our role as a Skills Service Organisation. AIS provide services to eleven allocated IRCs which cover Aviation, Corrections, Gas, Electricity Supply (Generation and Transmission, Distribution and Rail), Electrotechnology, Maritime, Public Safety (including Police, Fire and Emergency Services, Defence), Rail, Transport and Logistics, and Water industries. AIS supports these important industry sectors using our in-house capability and capacity in technical writing, quality assurance, project management and industry engagement in the production of Training Packages.

AIS was established in early 2016, 20 years after its predecessor the Transport and Logistics Industry Skills Council (TLISC) was established in 1996. More information about AIS can be found at http://www.australianindustrystandards.org.au.

- We support industry growth and productivity through our modern innovative approach to establishing skills standards.
- We provide high-quality, professional secretariat services to help our allocated industry reference committees develop the skills that industry needs.
- We partner with industry to shape the workforce of the future.

Visit our Engagement Hub on our website – www.australianindustrystandards.org.au

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